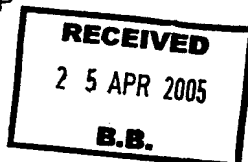


# PATENT COOPERATION TREATY

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

BROOKES BATCHELLOR LLP  
102-108 Clerkenwell Road  
London EC1M 5SA  
GRANDE BRETAGNE



## PCT

### NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(PCT Rule 71.1)

Date of mailing  
(day/month/year)

20.04.2005

Applicant's or agent's file reference  
DB/REP03035WO

#### IMPORTANT NOTIFICATION

International application No.  
PCT/GB2004/000309

International filing date (day/month/year)  
26.01.2004

Priority date (day/month/year)  
24.01.2003

Applicant  
REDDING, John

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary report on patentability and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

#### 4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international  
preliminary examining authority:



European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
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Authorized Officer



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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference DB/REP03035WO		FOR FURTHER ACTION	See Form PCT/PEA416
International application No. PCT/GB2004/000309	International filing date (day/month/year) 26.01.2004	Priority date (day/month/year) 24.01.2003	
International Patent Classification (IPC) or national classification and IPC E02F3/92, E02F5/00			
Applicant REDDING, John			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 9 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau) a total of 4 sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input checked="" type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input checked="" type="checkbox"/> Box No. VI Certain documents cited</p> <p><input checked="" type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand  24.08.2004		Date of completion of this report  20.04.2005	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer  Laurer, M  Telephone No. +49 89 2399-7079 	

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/GB2004/000309

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**Box No. I Basis of the report**

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1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

**Description, Pages**

1-14 as originally filed

**Claims, Numbers**

1-19 filed with telefax on 24.08.2004

**Drawings, Sheets**

1/6-6/6 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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**Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 1-10

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for the said claims Nos. 1-10

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form

☐ has not been furnished

☐ does not comply with the standard

the computer readable form

☐ has not been furnished

☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.

☐ See separate sheet for further details

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

Novelty (N)	Yes: Claims	11-19
	No: Claims	
Inventive step (IS)	Yes: Claims	11-19
	No: Claims	
Industrial applicability (IA)	Yes: Claims	11-19
	No: Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

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**Box No. VI Certain documents cited**

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**1. Certain published documents (Rule 70.10)**

and / or

**2. Non-written disclosures (Rule 70.9)**

**see separate sheet**

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**Box No. VII Certain defects in the international application**

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The following defects in the form or contents of the international application have been noted:

**see separate sheet**

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**Box No. VIII Certain observations on the international application**

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**Re Item III**

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability;

- 1.1 The subject-matter of claims 1-10 has been added under Article 34 PCT. Without prejudice of admissibility under Article 34(2)(b)PCT, last sentence, the current set of claims does not comply with Rule 13 PCT.
- 1.2 The common subject-matter of independent claims 1 and 11 can be summarised as: An apparatus (suitable for underwater sediment management) comprising a body and orientation means which, in use allow orientation of said body (or the whole apparatus) with respect to the sea or river bed. This, prior art is known from US-A-6125560 (cited in the current application), see figures 4, 5A, 5B.
- 1.3 **First group of claims**  
The subject-matter of independent claim 1 is characterised in that the (support craft) orientation means "allow orientation of said body with respect to the bed **in terms of height, and angle of inclination to the bed while stationary or in transit**" as potential special technical features. The resulting technical effects can be summarised as: The possibility to orientate such an apparatus with respect to the sea or river bed in terms of height and angle of inclination. The objective technical problem can be formulated as: Improving the handling of a sediment management apparatus.
- 1.4 **Second group of claims**  
Claims 11-19 (representing subject-matter of the originally filed and searched claims 1-10) are directed to an apparatus comprising a body which emits a "wash of water downwards towards an area of sea or river bed". According to independent claim 11 such apparatus is **characterised by features concerning the fluid flow and regulation through the apparatus like "inlet and outlet flow path ... with openings at the bottom of the body" and an "adjustable flow regulator ... provided adjacent the inlet of the inlet flow path"** as potential special technical features. The resulting technical effects can be summarised as: Guiding and adjustably regulating the flow through such an apparatus. The objective technical

problem can be formulated as: Improve fluid flow through such an apparatus.

- 1.5 Independent claim 1 does not mention the potential special technical features of independent claim 11 and vice versa (see paragraphs 1.3 and 1.4). The application currently contains at least two groups of inventions which are not so linked as to form a single general inventive concept. See different potential "special technical features" with different resulting technical effects for solving different objective technical problems. Thus, the current application does not meet the requirements of Rule 13 PCT.
- 1.6 If the current "non-unitary" set of claims had been already present in the search phase a "lack of unity" objection would have been raised during PCT-Chapter I. Thus, the current search only covers the second group of inventions, namely claims 11-19; the additionally claimed subject-matter (Claims 1-10) has not been searched by the international searching authority. Thus, no international preliminary examination concerning the subject-matter of current claims 1-10 need be carried out (Rule 66.1 (e) PCT).

#### **Re Item V**

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement;

## **2 Novelty and inventive step**

- 2.1 In the terms of current independent claim 11, US-A-5607289 (=D1) shows in figure 3 an apparatus comprising a body (39) having a bottom face (underside of said body at 39) and comprising an outlet flow path (duct around propeller 20, see arrows 33) in which is mounted thrust means (20) to direct, in use, a wash of water (33) downwards towards an area of sea or river bed or the like, orientation means (25, 51, 54, 56) to connect said apparatus (see figure 6), in use, to a support means (50 of figure 6) to orientate said apparatus with respect to the sea or river bed (the apparatus of D1 can be placed on the sea bed through the umbilical connection 51), and at least one inlet flow path (at 38) through which water is supplied, in use, to the thrust means (20);

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wherein the inlet flow path (at 38) and outlet flow path (duct portion at 15) are provided with respective openings in the bottom face of the body (at 39) and wherein at least a portion of the outlet flow path comprises a duct (see figure 3); and wherein the thrust means (20) comprises an impeller (at 20) mounted within the duct.

2.2 The distinguishing features of the claimed subject-matter can be summarised as: an adjustable flow regulator is provided adjacent the inlet of the inlet flow path. Thus, the claimed subject-matter complies with Article 33(1)(2) PCT.

2.3 The resulting technical effect can be summarised as:  
Different flow rate and pressure towards the different sea beds;

2.4 The objective technical problem can be formulated as:  
Adaptation of such an apparatus to different environments.  
Using an adjustable flow regulator adjacent an inlet of the inlet flow path is neither known from, nor rendered obvious by the available prior art (Article 33(1)(3) PCT).

2.5 The dependent claims 12-19 also comply with Article 33 PCT (PCT-Guidelines Chapter 13.19, Rule 6.4(b)).

**Re Item VI**

Certain documents cited;

**3.1 Certain published documents**

Application No Patent No	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
US-A1- 2003/0041483	06.03.2003	07.11.2001	28.08.2001

3.2 This PCT application (having a filing date on 26.01.2004) claims priority from the unpublished GB application GB0301660.7 filed on 24.01.2003.  
The above mentioned intermediate document US-A1-2003/0041483 which was filed on 07.11.2001 and published on 06.03.2003 claims priority from the unpublished GB



application GB200120803.2 which has been filed on 28.08.2001.

As US-A1-2003/0041483 is considered to disclose all the features of current independent claim 11 the application GB200120803.2 should also disclose these features.

Following Article 8(2) PCT and Article 4 of the Paris Convention, an applicant is entitled to claiming priority during 12 months after filing of the **first** application, cf. Article 4(C)(1) Paris Convention. It would appear that GB200120803.2 is the **first** application. The priority term therefore seems to have expired prior to filing of the PCT application. The PCT application accordingly does not appear to be entitled to the claimed priority. Since there is no copy of GB200120803.2 on record, it cannot be checked which combination of features are included therein.

Should the current application not be entitled to the priority, the claimed subject-matter of claim 11 would lack novelty over US-A1-2003/0041483.

#### **Re Item VII**

Certain defects in the international application;

- 4.1 Prior art documents, in particular D1, D2 and D3 have not been cited in the description (Rule 5.1(a)(ii) PCT).
- 4.2 The formulation of the independent claim 11 does not comply with Rule 6.3 PCT.

#### **Re Item VIII**

Certain observations on the international application;

### **5 Clarity**

- 5.1 The formulation of the claims does not comply with Rule 6.2(b) PCT because the features of the claims are not provided with reference signs placed in parentheses in order to increase the intelligibility of the claims.
- 5.2 The embodiment of figure 9 showing a "reverse flow (priming)" with upwardly directed

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flow through the apparatus does not fall under the definition "thrust means to direct, in use, a wash of water downwards towards ... sea or river bed" of current independent claim 11 (Article 6 PCT).

JC12 Rec'd PCT/PTC 20 JUL 2005

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## CLAIMS

1. An apparatus for underwater sediment management by selective removal of bed material from one area and deposition at another, the apparatus comprising a wholly suspended body connected to and suspended from a support craft orientation means, which, in use, allow orientation of said body with respect to the bed in terms of height, and angle of inclination to the bed while stationary or in transit.

2. An apparatus as claimed in Claim 1 having a bottom face incorporating an outlet flow path in which is coaxially mounted, close to the outlet end, a swirling jet generating means to direct, in use, an unobstructed swirling fluid jet of water downwards towards an area of sea or river bed or the like; said outlet flow path forming part of a centrally located duct with its upper inlet end incorporated wholly within the body; wherein the inlet and outlet flow paths are provided by respective openings in the plane forming the bottom face of the body.

3. An apparatus, as claimed in Claim 1 or Claim 2, wherein the paired inlet openings, located either side of the duct outlet, each comprise an adjustable flow regulator in the form of multiple louvre plates housed within the body, wherein the louvre plates of respective flow regulators being angled in opposite directions thereby causing deflection of the inlet flow helping to reduce the turning moment induced in the body by the rotation of the propeller; said louvre plates also acting as a grillage to prevent ingress of debris.

4. An apparatus, as claimed in any one of Claims 1 to 3, wherein the upper surface of the body is provided with sealable hatch openings to provide man access, but which when sealed make the top and sides of the body air- and water-tight; save only for non-return valves provided in the upper surface that allow egress but not ingress of air.

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5. An apparatus, as claimed in Claim 4, wherein the hatch covers are openable or removable when the body is not operating in shallow water and when inlet flow regulation is not required.

6. An apparatus, as claimed in any preceding claim, wherein the swirling fluid jet of water is unidirectional and is created by a ducted impeller, which also imparts vortical flow elements to the swirling jet.

7. An apparatus as claimed in claim 6 wherein said ducted impeller is driven by an hydraulic motor, located co-axially within the duct, and having variable speed control and forward/reverse rotation.

8. An apparatus, as claimed in any preceding claim, comprising a body adapted to be coupled together with like bodies in a number of different configurations for the purposes of multiple jetting operations.

9. An apparatus, as claimed in any preceding claim, which can be used in very shallow water by virtue of the inlets being located on the bottom face and the body acting as a syphon.

10. An apparatus, as claimed in any preceding claim, further comprising a flange plate formed in the bottom surface and surrounding the duct outlet to enable the attachment of a flared nozzle for the purpose of manipulating the swirling jet.

11. An apparatus comprising a body having a bottom face and comprising an outlet flow path in which is mounted thrust means to direct, in-use, a wash of water downwards towards an area of sea or river bed or the like, orientation means to connect said apparatus, in use, to a support means to orientate said apparatus

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with respect to the sea or river bed, and at least one inlet flow path through which water is supplied, in use, to the thrust means; characterised in that the inlet flow path and outlet flow path are provided with respective openings in the bottom face of the body; in that at least a portion of the outlet flow path comprises a duct; and in that the thrust means comprises an impeller mounted within the duct; and wherein an adjustable flow regulator is provided adjacent the inlet of the inlet flow path.

12. An apparatus as claimed in Claim 12 wherein the flow regulator comprises a louvre assembly.

13. An apparatus as claimed in Claim 11 or Claim 12 wherein the inlet and outlet flow paths are parallel, but of opposite directions.

14. An apparatus as claimed in any one of Claims 11 to 13 wherein the duct is formed with an outlet in the undersurface of a central section of the body.

15. An apparatus as claimed in any one of Claims 11 to 14 wherein the body is in the form of a wing having an angled face at at least one of the leading and trailing edges thereof.

16. An apparatus as claimed in any one of Claims 11 to 15 wherein the impeller creates a swirling flow comprising embedded vertical flow elements.

17. An apparatus as claimed in any one of Claims 11 to 16 wherein the impeller is driven by an hydraulic motor.

24-AUG-2004 16:13

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TO EPO MUNICH

P.09/11

19.

18. An apparatus as claimed in any one of Claims 11 to 17 wherein the duct has a length of about  $\frac{2}{3}$  the depth of the apparatus body.

19. An apparatus as claimed in any one of Claims 11 to 18 wherein the duct has an inlet and an outlet and the inlet is formed with a bellmouth.

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